BROOKHAVEN NATIONAL LABORATORY PHYSICS DEPARTMENT	Number: PO-P-ATF-0027	Revision: 0
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Subject: RF Gun cathode replacement procedure		Prepared by: Mark Montemagno
Reviewed by ESH Coordinator:	Approved by ATF Head:	Approved by Department Chair:

RF Gun cathode replacement procedure

1. With Gun water flowing and Gun temperature stabilized, physically measure the gap between the cathode and Gun in 4 places with feeler gauges.
2. Remove RF load
3. Install RF launcher
4. Network Analyzer Forward to launcher
5. Network Analyzer Reverse to Gun Reverse
6. (With Gun chiller on and Gun temperature stabilized) Measure 2 peaks under vacuum (should be about 3MHz apart)
7. Record frequencies of 2 peaks; Measurement #1; one peak should be 2856 precisely
8. Fill Gun with N2.
9. Measure the 2 peaks again; Measurement #2. (peaks should shift by about 1MHz)
10. Turn off water. If: gun is cooler that ambient Then: allow it to warm up.
11. Bleed up gun with N2.
12. Remove old cathode with N2 flowing.
13. Hand tighten the new cathode in place
14. Observe the network analyzer; continue to uniformly torque the cathode bolts until the network analyzer shows 2 peaks
15. At about 0.005" before physical measurement in step 1, pump out and leak check
16. Continue to torque bolts (Torque the bolts closest to detected leak first)
17. End Result:
    1. Cathode needs to be parallel to Gun, worst case 0.001" off.
    2. No Leaks
    3. Frequency peaks match Measurement #1, (amplitude not critical)
18. All Ion pumps should be on; pump-out port should be closed and sealed
19. Turn on Gun water. Allow Gun temperature to stabilize.
20. Once Gun temperature is stabilized and RF peaks look good, do a final check for water leaks and be sure all tools have been removed from the area.
21. Call Marcus, ask to install Gun Cathode camera and check optical alignments
22. Close Clam shell and prepare for Gun/cathode conditioning
23. Remove launcher and replace RF load